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The Start of the Gordon Bennett Balloon Race, Antwerp

(c) Herbert Photos

VOLUME XX

NUMBER 26

SPECIAL FEATURES

SOARING FLIGHT

THE CAPRONI BOMBER

THE GUGGENHEIM AIRPLANE SAFETY COMPETITION

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The New Spirit

ONE OF THE most encouraging features of military aeronautic development is the growing tendency to give all branches of the service a good working knowledge of aeronautics. Both Annapolis and West Point are giving fairly complete courses in the rudiments of aeronautics, including a certain amount of actual flying. The Army has recently gone a step further and has decided that all Army officers of less than fifteen years commissioned service shall do ten hours of flying as part of a course in the practical uses of aviation in Army tactics.

These new military regulations are of a double significance. They show, in the first place, a decided change in the attitude of the ranking military officials and, in the second place, they ultimately will bring about a decided change in the attitude of all officers toward aviation. Changes in the organization of the military service come about slowly. Public servants are of necessity, conservative and advocates of a new order are open to attack. It took the Great War to bring about the development of any air service at all. It has taken the full force of aroused public opinion to bring about the changes which are going on in the status of military and naval aviation. Compulsory aeronautical experience for practically all the Army officers is only one phase of the long continued pressure which must be brought to bear to overcome military conservatism.

The order is, perhaps most significant as demonstrating the acknowledgement of the growing importance of aviation, but it also will have very practical results. The officers who take the courses in aeronautics will have a much truer realization of the possibilities and limitations of aircraft. They will understand the problems and will take a much more sympathetic interest in the development of the Air Service.

It is hoped that there will gradually be brought about a new spirit of cooperation between the Air Service and the other branches of the Army and Navy. In the past, there has often been a feeling of jealousy, amounting to almost open hostility which has not been good for our national defense. The new regime will give the air service a chance to establish more friendly relations with the rest of the military personnel.

The Guggenheim Competition

UNDOUBTEDLY ONE of the most interesting items in aeronautical news at this time is the announcement, made elsewhere in this issue of AVIATION, of the tentative plans of the Guggenheim Fund for the Promotion of Aeronautics. It will be remembered that when several months ago Daniel Guggenheim made known his generous gift of $2,500 000 to the cause of advancing aviation, the opinion was expressed in these columns that with the very able and conscientious body of men gathered together to sponsor the Fund, some real good would result and that assistance would be directed to the quarter in which it would have the greatest value. Since the preliminary announcements of the Fund, there has been a long silence during which a very careful study of the present status of aeronautics has been going on, in the interests of which Harry F. Guggenheim, president of the Fund, and Admiral H. I. Cone, vice-president, have toured Europe with a view to obtaining a clear idea of the state of advancement abroad. This tour has now ended and the policy to be adopted by the Board of Management is the immediate outcome.

It is of the greatest interest to note how Mr. Guggenheim and Admiral Cone have evidently been impressed with the work being carried on abroad toward the attainment of greater safety in flight, for the most part through the agency of enabling slower landings to be made by airplanes, either in the direction of the Auto-Giro principle or through the improvements of the numerous wing devices which enable adequate control to be obtained at speeds lower than is at present possible. That the further development of these principles is of the greatest importance there is absolutely no doubt, regardless of whether the present system of control is considered to be adequate or not, upon which subject there seems to be some difference of opinion, and the organization of a competition, whether international or otherwise, to encourage further work along such lines is certainly one of the finest things to which the Fund could direct its attention. Furthermore, the allocation of $150 000 and possible $200,000, as prize money for this competition is likely to bring out some very real advancement, since these sums are sufficient to draw the attentions of the best minds in the world, along quite elaborate lines of experimentation.

In addition to the announcement of the competition, there are definite indications that the solutions of certain important problems of aircraft construction and navigation are to be encouraged through the Guggenheim Fund and, on the whole, it would seem that Daniel Guggenheim, has not only done for world aeronautical development a great service in establishing the Fund, but, in placing the sponsorship of the Fund in such able hands, has greatly increased its real usefulness and value.

A Potential Airline

THE POSSIBILITIES of an express airplane service operating in conjunction with ocean liner traffic is by no means a new idea but every now and then a striking example of how the idea could be developed appears. Recently, according to reports, an engineer was obliged to sail from Southampton for the United States before some plans, which were of great importance to him, were available. He sailed without the plans, the latter being hurried by airplane from the London Airport to Southampton and thence by seaplane to Cherbourg where they arrived in good time to be delivered to the passenger of the steamer before sailing time from the French port. Presumably the affair was somewhat expensive but it is conceivable that there might be many occasions which would warrant the expense, especially if a regular service of this nature were available, thus reducing, to a certain extent, the costs

The Guggenheim Aircraft Competition

Board of Trustees of Guggenheim Fund Announces Tentative Plans.

THE BOARD of Trustees of the Daniel Guggenheim Fund for the Promotion of Aeronautics has, after careful consideration, come to the conclusion that the Fund should direct its primary energies to the promotion of ways and means to secure *safety in flying*

Since Daniel Guggenheim placed at the disposal of the Board of Trustees the sum of $2,500,000, the Board has been studying the Directions in which its resources could best be used for fundamental advancement of the art and science of aviation It was realized that, unless some well-defined policy was established, the money at the disposal of the Fund could easily be dissipated without fundamental results

The officers of the Fund have, accordingly, made a careful inquiry into the conditions surrounding aeronautics both in this country and Europe, and have consulted officers of the U. S Government and foreign governments, as well as experts, manufacturers and operators of airplanes in many countries. It is felt that if a fair factor of safety is established in the practice of aviation, other measures of progress will follow rapidly and as a matter of course.

Importance of Safety Element

The Fund might have devoted its efforts to the development of airdromes, sound policies of government control, development of meteorological and communication services, and the perfection of flying administration to the end that aerial transportation should be operated in the same orderly manner as rail and marine transportation. All of these are important matters, but are for the most part government functions and secondary, it is believed, to the *development of safety.*

The primary reason for the slow commercial development of aviation in this country and for its unsatisfactory financial status in those countries where, through government subsidies, air lines are established, would seem to be lack of public confidence in flying The success of commercial aviation should be assured the day that the public can be convinced, not by statistics, but by actual demonstration, that airplanes are inherently no more dangerous than steamships or railroads.

From fundamental research work now in progress and from the construction of some new types of airplanes involving a number of radical aerodynamic departures from the conventional airplane, sufficient progress has already been made in the direction of safety to justify faith that a complete solution of this problem is possible and that it may even be very near at hand. Indeed, today, flying is actually much safer than it is generally assumed to be

Due to the financial status of the infant airplane industry in all parts of the world, manufacturers are financially unable to develop, on their own initiative, types that have not a definite commercial value This restricts development for the most part to war types Governments, at the present day, are almost the sole buyers of airplanes. Some orders, to be sure, are placed for commercial planes to operate over government subsidized air routes in Europe and for the newly organized mail routes in America, but this demand is insignificant in comparison with the military demand

Such commercial planes as are made may naturally be, to a certain extent, adaptations by the manufacturers of military types to meet commercial needs The aerial transport companies are unable to devote primary attention to designing a safe plane Their financial positions are not strong, their present most urgent need is a plane with a high pay load economical of operation and construction They are unable to devote that attention primarily to *safety* which is fundamentally required if permanent progress is to be realized

The chief problem in promoting safety in flying may be thus stated Today, when the speed of the conventional airplane is reduced below its stalling speed, it ceases to function satisfactorily If the airplane is flying at sufficient altitude and is aerodynamically well constructed, the pilot may recover from the stall and regain control However, should the stall occur in leaving the ground, a crash is inevitable

In a like manner in forced landings, crashes are commonly due to the speed necessary to avoid a stall in attempting to fly over some object adjacent to a closely confined place chosen for the landing or in landing in uneven or closely confined ground

Maj R H Mayo, Consulting Engineer and representative of the Fund in England, has summarized as follows the essential characteristics of the present day airplane which make the development of the safety factor necessary

"(1) The landing speed is far too high, and the length of run after landing is too great

(2) The gliding angle is too flat, making the approach to a given spot for landing too difficult

(3) The length of run required before taking off is too great.

(4) The angle of ascent after taking off is not great enough

(5) If the airplane is stalled, it becomes unstable and at the same time control is lost. . . ."

In spite of these difficulties, however, inquiry discloses the fact that great strides are being made in meeting them fundamentally

In England, for example, great progress has been made recently toward the solution of the problem of inherent stability and complete control at low speeds Prof B Melville Jones at Cambridge has done and is continuing to do highly important fundamental work on this subject, the value of which is demonstrated in Handley-Page's slot and aileron control Capt G T R Hill's tailless airplane is another highly important step in the direction of inherent stability Senor de la Cierva's extraordinary new development for flight, the Auto-giro, also is being actively promoted in England

The Competition

To bring to a focus, and to give the greatest possible encouragement to every endeavor to make the airplane safe, the Board of Trustees of the Guggenheim Fund have determined to organize an "Open International Aircraft Competition" We shall probably appropriate $150,000 to $200,000 for this purpose so as to make the competition interesting and attractive to the best designers and manufacturers of aircraft throughout the world

This competition will be held in this country Experts from many countries will be consulted in the framing of rules and regulations to govern the contest, and it is believed that such interest can be aroused that this contest will not only become an actual inducement to rapid development of safety, but also serve as a demonstration of the marvelous progress which has been made in the direction of safe flying

In addition to the International Competition, details of which will be announced from time to time, the Trustees of the Daniel Guggenheim Fund have authorized its officers to make a careful investigation and prepare further specific recommendations working toward

(1) The encouragement of the perfection of flying instruments and accessories with particular regard to the perfection of radio or other aids to navigation and the control for fog flying

(2) The encouragement of research in aerology

(3) The encouragement of development of means to prevent collision.

(4) The encouragement of development of aircraft with engine accessible in flight

(5) The encouragement of development of fire and splinter-proof fuselage

Flying is now entering upon a new era, and the world is on the verge of developments which will make it clear that not only is flying over great distances mechanically feasible, but that the whole art and science can be made so nearly accident proof as to place flying on a basis of safety comparable with traveling by rail, steamship or automobile

The Soaring Flight Problem

A Complete Analytical Discussion of Soaring Flight.

By H. HARTSHELL

FREQUENTLY THE terms "soaring" and "gliding" have been used interchangeably, but soaring is properly used only to describe a sailing flight in which the power for supporting the airplane is obtained from the horizontal wind such as the trade winds over the ocean

Principles Involved in Soaring

Before considering the instant solution which will be presented, the principles fundamental to the solution of soaring flight will be stated In this short exposition it is not possible to support the two following statements, but each can be deduced from the principles of Newtonian Dynamics and neither is to be considered as merely an assumption

1 A body in the air, whose velocity referred to the earth is not the vector sum of its own velocity referred to the air and the wind velocity, can be acted upon by the wind and can absorb kinetic energy (referred to the earth) from the wind current A body in the air whose velocity referred to the earth is equal to the vector sum of its own velocity through the air and the wind velocity, is entrained in the wind and cannot absorb such energy from the wind current

2 The dynamic system of soaring flight is a system of three bodies, i e the airplane, a mass of air acted upon at each instant, and the mass of earth.

From these facts two deductions are at once evident (1) only heavier-than air craft can soar in a horizontal wind current, and (2) no deductions concerning soaring flight are tenable as complete unless it is treated as a problem in three bodies, not a problem in two bodies such as one involving only the air and the airplane

A further deduction from the first principle stated above is that soaring flight must be a continuously repeated cycle of accelerations, in which the step of absorbing energy alternates with the step of restoring conditions under which a further absorption of energy is possible This follows from the principle that a body supported in, and absorbing energy from, a wind current becomes entrained in the wind and is thereby rendered incapable of receiving further energy from the wind When fully entrained in a wind the sailplane has, with reference to the earth, a certain kinetic energy due to the entrainment of drift This kinetic energy is acquired during a period when the air current transfers energy to the sailplane.

The Soaring Cycle

This theory of soaring flight contemplates a repetition of a cycle which consists of the step of absorbing kinetic energy and the step of dissipating a portion of the absorbed kinetic energy which was acquired in a process of entrainment The kinetic energy, referred to the earth, of a sailplane due to its drift of entrainment in a wind varies with the direction of flight When that kinetic energy acquired during the entrainment process is dissipated, the drift or entrainment component of the earth velocity of the sailplane is a minimum and the sailplane is in position to repeat the first step or "sailing stroke" of the cycle. The sailing stroke persists during the acquirement of an increased kinetic energy referred to the earth due to entrainment in the wind. It is the full drift velocity due to the wind that the airplane acquires during the sailing stroke that brings it to its close

The increased drift velocity gives the sailplane a kinetic energy that must be dissipated during the next step or "recuperative stroke" and, in accordance with the theory to be presented by an example, that energy, during its dissipation, is made useful in supporting the sailplane During the recuperative stroke the balance which customarily exists in power flight between the vertical force from the air and the weight of the airplane is not maintained Accordingly, vertical accelerations as well as horizontal accelerations are present and in the example following, the sailplane receives increased elevation or its equivalent in energy for flying loss as a part of the kinetic energy is transmitted, against the force of gravity, to potential energy

The sailplane to soar needs to be equipped with supporting wings and additional sail areas so that the horizontal force from the air and the vertical force from the air can be varied independently

In respect to the horizontal force from the air the sail areas must be able to function as follows —

1 To apply a transverse lift force either to right or left at will when the relative air stream is parallel to the plane of symmetry,

2 To present suitable angles of attack to a relative air stream that makes a large acute angle with the plane of symmetry, in other words with an air stream coming over either bow quarter, and

3 To shift the effective center of action of the horizontal force longitudinally of the sailplane, or otherwise, to effect a similar ruddering action

System of Reference

Motions taking place in planes perpendicular to each other may be treated independently of each other, and the resultant motion will be completely portrayed by the vectorial sum of the results found in the separate planes The displacement of the soaring sailplane with reference to the earth may be completely described by analyzing its motions in a horizontal plane fixed with reference to the earth, simultaneously with its motions in a vertical transverse plane passing through the center of mass of the sailplane and moving with it

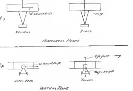


Fig 1.

The sailplane will be introduced flying horizontally across wind under some propelling force to sustain flight Throughout the example to be illustrated the angle of attack measured in the plane of symmetry will be assumed constant and the air speed in the plane of symmetry will be assumed greater than the wind speed As introduced the flight referred to the air is in a straight line perpendicular to the direction of the wind on the earth, and the vertical force from the air is equal to the weight of the sailplane The sailplane is assumed to be entrained and the velocities and forces just before commencing the soaring cycle are represented in Fig 1.

Beginning Soaring Cycle—Recuperative Stroke

To make this discussion as brief as possible a special example will be chosen and the motions and forces of one complete cycle followed through

The soaring cycle is started from a position similar to that shown in Fig 1, with no mechanical propelling force acting, by increasing the vertical force from the air to a magnitude larger than the weight (mg), thus destroying the balance of the vertical forces and introducing a compensating acceleration. This force is to continue in action as a centripetal force with respect to the drift velocity The magnitude of the force

introduced is not arbitrary, but depends on the air speed, the drift velocity, and the desired radius of turning in the horizontal plane. The initial magnitude of the vertical force will be expressable by the equation

$$f = mg + \frac{W^2 m}{p}$$

where f = lift force in vertical plane,
m = mass of sailplane,
g = acceleration of gravity,
W = speed of wind, assumed constant and horizontal,
p = a radius of turning (curvature) in a vertical transverse plane

The velocities, and forces impressed on the sailplane at the instant the soaring cycle is started are shown in Fig 2

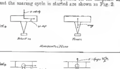


Fig 2

During the motion in the example chosen, from the position of flight across wind to that of flight against wind, there will be no relative air velocity in the vertical transverse plane. This condition can be maintained by ruddering if necessary. The air velocity is only in the vertical longitudinal plane, i. e., plane of symmetry.

Analysis in Vertical Plane

As the drift velocity is deflected upward by the accelerations applied, the force from the air is kept normal to it and the instantaneous magnitude of the lift force from the reaction of the aerofoils with the air may be expressed by equations of the following form —

$$f = \frac{m v^2}{p} + m g \cos \theta$$

$$f = \frac{m W^2}{p} - 2 m g + \frac{3 m W \cos \theta}{2p} - 3 m g \cos \theta$$

where
f = lift force in vertical transverse plane.
m = mass of sailplane
v = instantaneous magnitude of the earth velocity in the vertical transverse plane.
p = a radius of curvature in the vertical transverse plane.
g = acceleration of gravity.
W = speed of the wind
θ = angle between the direction of the force f, and the vertical. $v = W$ when $\theta = 0$, and $v = 0$ when θ is maximum

The path of motion, the velocities and the forces involved during the continuous sequence of accelerations from flight across the wind to flight against wind are illustrated in the diagram Fig 3

The component velocity of the sailplane with reference to the earth, shown in the vertical transverse plane, decreases under the action of a component of the weight of the sailplane. During this action in the vertical transverse plane the vertical force acting on the sailplane is not constantly equal to its weight

Analysis in Horizontal Plane

The motion in the horizontal plane must be synchronized with the motion in the vertical plane. In this particular example the longitudinal axis, or the "nose" of the sailplane, must be turned through 90 degrees in the horizontal plane during the motion described above in the vertical plane. The synchronous condition is satisfied when the horizontal component of v, the instantaneous earth velocity shown in the vertical transverse plane, is maintained equal to the projection of W, the velocity of the wind, upon the vertical transverse plane

The synchronous condition tying the action in the horizontal plane to that in the vertical plane may be expressed by the equation:

$$v \cos \theta = W \cos \varphi$$

Where, φ is the angle through which the sailplane has turned in the horizontal plane with reference to the wind direction, starting from zero in this problem when the line of flight through the air is across the wind

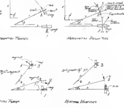
When the sailplane has turned in the horizontal plane to flight against wind the drift velocity in the transverse vertical plane is zero, under the conditions of the synchronous equation

The earth velocity of the sailplane in the horizontal plane must decrease in this turn because of the inherent constancy of the air speed in the plane of symmetry under constant angle of attack. The only force acting to decrease the magnitude of this velocity is the drag, which amounts in other words, to flying loss or gain in altitude. The lift forces are perpendicular to this velocity. This decrease in horizontal earth velocity of the sailplane provides a mass acceleration, opposing the drag force, shown in the diagram as m a, where a is a variable acceleration. When this force, m a, is insufficient to maintain a horizontal flight the sailplane will tend to glide downward, when this force, m a, is greater than needed for horizontal flight the sailplane will tend to climb.

The recuperative stroke is completed here in flight against wind and when the earth velocity in the transverse vertical plane is zero

Continuation of Soaring Cycle—Sailing Stroke

At this instant in the soaring cycle the forces undergo a discontinuous change and the cycle begins a new step. During the remainder of the cycle the vertical force is maintained equal to the weight. This balances the forces in the vertical transverse plane. The sailplane may, however, lose altitude, fly horizontally or climb in accordance with the law that when a constant angle of attack is maintained, the air speed of an airplane is not materially changed by the application of horizontal longitudinal force. In case the longitudinal force is less than that necessary to supply horizontal flying losses the airplane will glide down, and in case it is greater, the airplane will climb.



RECUPERATIVE STROKE Fig 3

At the first instant in this step of the cycle, the sailplane is in flight against wind. With vertical forces balanced, a horizontal transverse force is applied from the sail area under

which the sailplane will commence to turn, the force acting as a centripetal force opposed by a centrifugal mass acceleration. As the turning proceeds the air velocity and the earth velocity of the center of mass of the sailplane will begin to diverge in direction. As projected on the horizontal plane the longitudinal axis is held in line with the earth velocity. This may require the application of a ruddering couple. When the air velocity comes over a bow quarter and the earth velocity lies in the plane of symmetry, the horizontal lift force from a sail area will have a forward component along the longitudinal axis of the sailplane. A horizontal force applied to the sailplane in this direction does not increase the air speed in the plane of symmetry, assuming a constant angle of attack of the wings, but affects its vertical velocity with respect to the earth. In Fig 4 the velocities and forces involved in this step from flight against wind to flight across wind, are illustrated. This flight path as projected in a horizontal plane may be considered to be a continuation of the path shown in Fig. 3

The sailplane in turning must increase its speed longitudinally relative to the earth in order to maintain the constant air speed in the plane of symmetry. The forward component of the horizontal lift force effects this increase in earth speed. When the forward component is in excess of the force necessary to do this, the force in excess does not result in increased air speed but is available to supply flying losses or gain in altitude of the sailplane. Since this force depends on the relative size of the sail area, it may be possible to bring about the excess force desired

The Sailing Action

The difference between the turn with the longitudinal axis in line with the air velocity and that with the longitudinal axis in line with the earth velocity, that brings about this sailing action, must here be brought out. The sailing action depends upon a law that need be only qualitative for purposes of this discussion, stated as follows —

> The lift force from the horizontal wings of an airplane is proportional to (dependent upon) the component of the air velocity in the plane of symmetry and does not vary proportionally to (is independent of) the component of the air velocity perpendicular to the plane of symmetry.

The air speed in the plane of symmetry, then, remains nearly constant with constant angle of attack, and is independent of the driving force applied

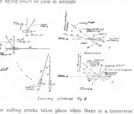
When the air velocity lies in the plane of symmetry the horizontal lift force from the air is perpendicular to the plane of symmetry and no force is acting to increase the *air speed*. Due, however, to the divergence between the air and earth velocities the earth velocity does not lie in the plane of symmetry and there is a component of the horizontal lift force tending to increase the speed of the sailplane *relative to the earth*. On the other hand, when the earth velocity of the center of mass of the sailplane lies in the plane of symmetry, the air velocity does not. Under the qualitative law (not quantitative) stated above, the component of the air velocity projected in the plane of symmetry is constrained to constancy with constant angle of attack. This gives in effect horizontal supporting surfaces working in an air stream of a lower speed than vertical sail areas

Completion of Sailing Stroke

In the particular example under discussion, the sailplane turns from flight against wind to flight across wind, the air velocity and the earth velocity diverging more and more as the turn proceeds, reaching a maximum in flight across wind. When this condition of flight across wind is reached the sailplane is kept by ruddering if necessary, with its plane of symmetry perpendicular to the direction of the wind. Under these conditions the sailplane will receive a linear acceleration under the action of the transverse force from the air, tending to entrain the sailplane in the wind, and to reduce the soaring angle to zero. The sailing action will, of course, continue as long as there is a soaring angle. When entrainment is complete, in flight across wind, this cycle of motions may be repeated

This theory of soaring flight is consistent with the principles of the conservation of energy and momentum. Soaring flight is found to result from a repeated cycle of accelerations. The fundamental flight path resulting from these accelerations is orbital, like the circling of soaring birds. The sailplane in such circling flight does not drift completely along with the wind, some drift it has, but the wind gains on it, moving past it when viewed from the earth, leaving some wind energy referred to the earth with the sailplane.

In the orbital flight path the sailing stroke persists while the sailplane turns from flight against wind to flight before wind and the recuperative stroke while the sailplane turns from flight before wind to flight against wind again. The horizontal momentum referred to the earth gained from the wind during the sailing stroke must be returned to the wind during the recuperative stroke, but no principle of dynamics requires that the energy referred to the earth taken from the wind during the sailing stroke be returned during the recuperative stroke. Portions of this energy may be otherwise accounted for such as by flying losses or gain in altitude



SAILING STROKE Fig 4

The sailing stroke takes place when there is a transverse component of the air velocity and with incomplete transverse entrainment, although complete longitudinal entrainment in the wind. During the sailing stroke momentum referred to the earth is transferred from wind to sailplane by the action of a series of instantaneous masses of air sharing their wind momentum with the sailplane to complete its entrainment. When one mass shares its momentum between itself and another mass a certain amount of energy, referred to the same datum as the momentum, is liberated and must be accounted for. This energy in this case is properly accounted for by flying losses or gain in altitude

The transfer of horizontal momentum, referred to the earth, is affected by the sail area, and the relative speed between air and sail area is greater during the sailing stroke than during the recuperative stroke. This indicates that less energy will be given back to the wind along with the momentum in the recuperative stroke than was taken from the wind in the sailing stroke

In the recuperative stroke the pendulum action of the sailplane may be likened to a pendulum bob starting its swing from its highest position in flight before wind, passing through its lowest position in flight against wind and reaching again its highest position in flight against wind. This action gives the sailplane the full effect, as far as the air speed is concerned, of continuous complete entrainment in the wind, without the effect as far as the earth speed is concerned of entrainment in the wind. This allows some of the energy referred to the earth, represented by the difference in kinetic energy between flight before wind and flight against wind to be appropriated to flying losses or their equivalent, gain in altitude

Elko, Nev.–Pasco, Wash., Air Mail

Varney Air Mail Route, C.A.M.5 Now Operating Regularly with Whirlwind Engined Swallow Air Mail Planes.

By CHARLES T. WRIGHTSON
Business Manager, Washington-Oregon Idaho Air Mail Service

ON APRIL 6, 1926, the first air mail from the Northwest was carried over route C.A.M.5 from Pasco, Wash., via Boise, Idaho to Elko, Nev., and there transfered to the Government-operated Transcontinental Air Mail The first southbound trip was made on time with the aid of a tail wind, but the northbound trip was held back two days because of the inability of the planes to fight the head winds, rains and snows, due to the fact that the planes were underpowered, although they were equipped with Curtiss C6 engines rated at 150 hp

It was found impossible even to approximate schedule time and some days the planes did not get through at all For this reason, Walter T Varney, contractor for route C.A.M.5, requested the Post Office Department to grant him sixty days extension of time in order to install Wright Whirlwind 200 hp. air-cooled engines in place of the original power plants. The sixty day extension was granted, and on April 10 five Whirlwind engines were ordered from the Wright Aeronautical Corporation The Wright Company, recognizing the emergency, bent every effort to supply the five engines as quickly as possible, and on April 20 the engines were received at the Boise Airport Installation of the engines was then made under the supervision of Kenneth J Boedecker, field service engineer of the Wright Company On May 8, the first Swallow with a Whirlwind engine was flight-tested by Leon D. Cuddeback, chief pilot for Route C.A.M.5 The airport at Boise is at an altitude of 2800 ft., but, nevertheless, the plane took off after a hundred foot run, and climbed to 20,000 ft. in 22 min Immediately after the Whirlwind powered plane took off, a Swallow with the original power plant took off after a run of 200 ft and climbed to 15,000 ft. in 45 min. Subsequently both planes were run side by side, and it was found that the Whirlwind plane with the engine turning at 1450-1500 r.p.m. kept even pace (approx 105 m.p.h.) with the other plane with engine running wide open The top revolutions of the Whirlwind in this installation is 1780 r.p.m. and the top speed of the plane with the Whirlwind is approximately 125 m.p.h.

On May 10 a check run for gasoline consumption and time was made over the mail route from Boise to Pasco and return. The return trip was made in 5 hr. 50 min. flying time for the 600 miles, and the gasoline consumption was 70 gal or 12 gal per hour (8.5 miles per gal.)

By May 22 all five Whirlwind engined planes had been tested and on Tuesday May 25 all planes were put on regular air mail schedule, but running "dead-head," carrying ballast instead of mail At this writing, May 28, after three and one half days of scheduled operation, only one plane has arrived late, and this delay was caused by poor visibility. On May 28, the official films of the Amundsen-Ellsworth Polar Expedition were carried from Pasco, Wash., via U. S. Air Mail Route C.A.M.5 to Elko, Nev., and there transferred to the Transcontinental Air Mail for New York. Forty-five pounds of film were carried Although the plane leaving Pasco was held up for an hour and a half awaiting the arrival of the films, it was only one hour late arriving in Boise The Elko plane was ready to go and the films were transferred and under way five minutes after the Pasco plane landed and were delivered to the Transcontinental Air Mail on time in Elko.

The Wright Whirlwind installation in the Swallow mail planes of the Washington Oregon Idaho Air Mail service. (Pilot Joe Taff supporting the plane!)

A fleet of Whirlwind engined New Swallows of the Washington, Oregon, Idaho Air Mail service operated between Pasco, Wash., and Elko, Nev by Walter T Varney under P.O. Department Contract

On June 1, regular Air Mail service was resumed over this route

During these days of running on schedule, the gasoline consumption has averaged 11 gal per hour (9½ mi./gal) which is equivalent to about two thirds the amount of gasoline used with the original power plants Oil is drained from tanks after twelve hours flying time. During the twelve hours flying approximately two gallons of oil is added to the original five in each plane

Chicago-Twin Cities Air Mail

The contract air mail service between Chicago and the Twin Cities—Minneapolis and St. Paul—by way of Milwaukee, started from Chicago on June 7 on the arrival of the night air mail service plane from New York. By this service, letters which leave New York one evening should reach Minneapolis or St Paul before noon the next day

The first plane left Chicago at 5 50 a.m. and was due at Milwaukee at 7 10 a.m. Mail was dropped at Lacrosse at 9 20 a.m. and planes are scheduled to arrive at St Paul and Minneapolis at 10 40 a.m. The contract for the service was let by the Post Office Department to Charles Dickinson.

Air view of St Paul Minneapolis, showing the Saint Paul Airport

St Paul celebrated the inauguration of this service with a parade, participated in by thousands of the leading citizens of the city, which terminated at the Airport, where a ceremony to mark the arrival and departure of the planes was held Among the mail carried were letters from Governor Christianson to governors of all states, Mayor L C Hodgson to mayors of other cities and greetings from President C Reinold Noyes of the St Paul Association to chief executives of the Chambers of Commerce in all parts of the U. S.

C D Dickinson, contract air mail operator, announced that he plans to start passenger service between St. Paul and Chicago before the end of the season. Laird Commercial airplanes are used on the service, equipped with Wright Whirlwind engines.

The storm, which the planes encountered on the second day of the service, resulted in the crash of one plane and the death of its pilot, Elmer Partridge Partridge was one of Chicago's best known pilots, a veteran flier, having flown since 1909 He was forty years old

The St. Paul Airport, which is municipally owned, is pronounced as comparable with the best in the world It borders a bend in the Mississippi River, opposite the center of the business district, and 2 mi South of the state capitol building

This route is an important one for it links up the Northern states with not only the Transcontinental Air Mail Service and the New York-Chicago night air mail, operated by the Post Office Department, but definite connection is made with southern points through the N.A.T. route, etc, etc

Radio Beacon Wave Assigned

An exclusive wave band of 290 kilocycles (1,034 meters) for direction beacon sending for the guidance of airplanes by radio was adopted May 28 by the inter-departmental committee on radio representing all departments of the government, meeting in the Department of Commerce.

This is the first step taken by the Government to provide radio direction facilities for aviation.

The action of the committee followed recommendations by a subcommittee on technical problems composed of Maj. J. O. Mauborgne, Signal Corps, Lieut. Comdr. T. A. M. Craven, Navy, and Dr. J. H. Dellinger, Bureau of Standards.

The committee recommended that the band, 285 to 305 kilocycles (1,052 to 983 meters), be set aside exclusively for radio beacon use for navigation and aviation. Continued use of 300 kilocycles (1,000 meters) for marine beacons was recommended, and in order to secure greater immunity from interference, the assignment of the 290 kilocycles band was made for aircraft use only.

"It is contemplated," a statement from the meeting read, "that these aviation beacons will transmit on the same frequency not only beacon signals but emergency weather information."

The action of the committee will determine definitely the kind of radio apparatus to be used at the landing fields, and also will affect the range requirements of the receiving apparatus on airplanes

At present, only the Army Air Field at Dayton, Ohio, sends out a beacon beam for the guidance of aircraft, and the aviator determines his directions by the intensity of the signal picked up by his receiving set Eventually, it is expected all landing fields will be equipped with beacon beam guidance systems.

According to Dr Dellinger, use of radio direction finders such as are installed on ships is not possible for aircraft because of the limited load a plane can carry. Sound directive signals can now be picked up by an ordinary airplane receiving set, he said, but the Bureau of Standards is working on a device which will include an indicator for direction finding making it possible for the pilot to note visually his direction instead of by listening for the beacon signals

Cotton Dusting

It is reported that the plans of the Huff-Deland Dusters, Inc., with headquarters in Monroe, La., include the use during 1926 of a fleet of eighteen airplanes in the annual combat against the boll weevil of southern cotton fields. All planes are of the Huff Daland Petrel type and practically all are powered with the Wright Whirlwind 200 hp. air-cooled engines, which have proven so efficient in the unusual work being done by the Huff-Daland Company.

During 1925 this Company dusted a total of 50,000 acres of cotton. Advance information from the Department of Agriculture indicates that there is a larger amount of boll weevil now in hibernation than in any year since 1915, and to offset this danger, which has already had a marked effect in the price of cotton futures, as evidenced in the markets, the Huff-Daland Company contemplates larger activities than ever before

It is understood that contracts have already been signed for an amount of dusting equal to that done in 1925, and it is the opinion of the Huff-Daland engineers that a total of from 90,000 to 100,000 acres of cotton will be dusted this year Their working zone will cover the entire southern cotton belt Extremely valuable cooperation in this work from Dr. B R Coad of the Bureau of Entomology of the Agricultural Department, and also from the Louisiana College of Agriculture has been reported.

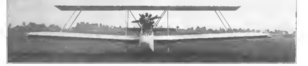
Argentine Fliers Safe

Bernardo Duggan and his two companions, who are flying from New York to Buenos Aires arrived at Victia, Brazil, by boat on June 20, after spending a week on the Island of Maraca, at which point they were obliged to alight because of a lack of fuel They were picked up by a fishing boat and hope to resume the flight as soon as fuel can be taken to Maraca

The Caproni CA.73 Bomber

A Twin Air-Cooled Engined Bomber Showing Possibilities as a Passenger Machine.

THE ITALIAN Caproni Company, which has, in general, devoted the major part of its attention to the construction of giant bombing airplanes, has recently produced a bomber of somewhat interesting lines, although it resembles closely the four engine bomber of 1924. The new plane is designated the Caproni CA.73 and is a twin engine fuselage plane with the engines mounted in an individual nacelle above the body in the interplane gap, in much the same manner as the arrangement of a flying boat.



The Caproni CA 73 Bomber (twin Jupiters, 420 hp each)

The wing arrangement is somewhat novel, the upper wing being considerably smaller than the lower wing. Both wings are of thick section, the span of the lower one being considerably larger than that of the upper, as is also the chord of the lower wing. This arrangement necessitates a very marked inward slope (upwards) of the outer interplane struts, this fact undoubtedly being largely responsible for the fact that, in spite, of the comparatively large span of the machine, there is only one interplane bay. The inward sloping struts undoubtedly provide a distinct lateral stiffening component in the wing structure. The only other interplane bracing struts are a single pair of vertical struts arranged in conjunction with the undercarriage structure on each side of the fuselage, and a sloping Vee arrangement between which the engine nacelle is mounted. The lower wing is attached to the top longeron of the fuselage. The top wing is flat while a pronounced dihedral is put into the lower wing. Ailerons are fitted to the lower wing only and these are balanced and of large size.

The engine nacelle is mounted above the fuselage on a double 'M' arrangement of struts which undoubtedly provide considerable rigidity, especially as these struts are all quite short in length. The engines are radials and each apex of the 'M' is arranged to support the actual engine bearer of each engine.

The undercarriage is simple and consists of two parts, each individual and carrying a wheel on one side of the fuselage. Each part consists of a normal double Vee structure braced laterally by means of a single sloping strut extending to the top fuselage longeron. Each Vee carries its own axle for its individual wheel.

Tail Surfaces

The tail plane is of normal form but consists of a biplane formation with the upper surface supported at a point near the top of the vertical fin. A single pair of interplane struts brace the tail structure just as in a small wing structure. Elevator flaps are fitted to each surface of the stabilizer group, these being split to allow for the movement of the rudder which is of normal balanced type.

The engines are Jupiter air cooled radials of 420 hp each, the forward engine driving a two-blade propeller while the after engine drives a four-blade propeller. Lorraine Dietrich engines of 450 hp each have also been fitted.

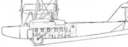
The Caproni CA.73 Bomber with twin Jupiter air cooled engines of 420 hp each

The brief general dimensions of the Caproni CA 73 are as follows

Length	49 5 ft
Span	82.0 ft
Height	18 5 ft
Weight Empty	7055 lb
Load which can be carried	4409 lb
Total loaded weight	11464 lb
Total which can be carried on one engine	2645 lb
Load per sq ft wing surface	7 lb
Load per horsepower	14 lb

Performance

The plane carries a pilot and observer with a forward and a rear gunner, each of the latter two having an individual cockpit fitted with the usual form of gun ring mounting. The machine is said to be very maneuverable, especially in



The Caproni Bomber as a possible passenger plane

view of its size. Being fitted with tandem engines, it is possible to fly with any one engine stopped with the minimum of difficulty in control and the load capable of being carried on one engine (2645 lb) is quite appreciable. The general performance of the machine is as follows

Maximum speed	115 118 m p h
Climb to:	
1000 meters (3280 ft)	5 min 20 sec
2000 meters (6560 ft)	12 min 30 sec
3000 meters (9840 ft)	21 min
4000 meters (13120 ft)	34 min

The Caproni Company has drawn up plans whereby the CA 73 can be transformed from a bombing plane into a commercial passenger machine. A cabin would be provided for ten passengers, seats being arranged in two rows in the cabin with an aisle between. Entrance would be through a door placed just under the leading edge of the lower wing and it is estimated that the plane would be very suitable for such an adaptation.

Cleveland-Louisville Air Mail

As a result of executive approval of legislation permitting the Post Office Department to contract for carrying mail by air on a weight instead of a count basis, the proposed contract air mail route from Cleveland, by Akron, Columbus, Dayton, and Cincinnati, (Ohio), to Louisville, (Ky), has been readvertised.

Bids were originally asked on this service April 14, returnable June 14, on the count basis, allowing the contractor not more than eighty per cent of the revenue. The returnable time has been extended to July 1, 1926, on the new basis of weight under which the contractor will be paid not more than $3 00 per pound.

Both the Department and the contractor are expected to benefit by the arrangement, the former saving money by eliminating a tedious count and much clerical work and the latter by being relieved of delay involved in making the count. The Cleveland-Louisville route will operate on a schedule of six trips weekly, as follows

Leave Cleveland	3 00 a m E T	Leave Louisville	6 00 p m C T
Leave Akron	3 35 a m E T	Leave Cincinnati	7 30 p m C T
Leave Columbus	4 15 a m C T	Leave Dayton	8 15 p m C T
Leave Dayton	5 15 a m C T	Leave Columbus	10 15 p m E T
Leave Cincinnati	6 15 a m C T	Leave Akron	11 45 p m E T
Arrive Louisville	7 30 a m C T	Arrive Cleveland	12 35 a m E T

A Sesqui-Centennial Air Mail

The Post Office Department is making plans for the establishment of a Sesqui-Centennial air mail route between Washington, D C and Philadelphia, to be operated by private contractors.

Announcement was made on June 16 by Acting Postmaster General Bartlett that bids for this route will be opened at noon on July 1, and it is expected that shortly thereafter the contract will be let for carrying on this service.

Landings will be made at or near the Sesqui-Centennial grounds in Philadelphia, and the dispatch of mail will be to and from the model postoffice established on the Exposition grounds. The schedule will provide for not less than six round trips each week. The contractor will be permitted to carry passengers as well as mail and he will be allowed under the law not to exceed three dollars a pound, including weight of equipment, for transporting the mails over this route.

The duration of this contract will extend over the period of the Sesqui-Centennial Exposition.

The Department will expect the successful bidder to commence service immediately on the award of the contract.

Detroit-Grand Rapids Air Mail

By direction of the Postmaster General an advertisement has been issued inviting proposals for the operation of a contract air mail route as follows

Detroit, Mich, to Grand Rapids, Mich., and return, with such intermediate stops as may be agreed upon later.

Service to be six round-trips per week, and on such a schedule as may be found most advantageous to the department and the contractor. Distance 142 miles each way.

This supersedes the advertisement of May 25, 1926, for this route. The re-advertisement is made because of legislation amending Sec 4 of the Act of Feb 2, 1925. Therefore, Sec 4 as shown in the advertisement is amended as follows

"That the Postmaster General is authorized to contract with any individual, firm, or corporation for the transportation of air mail by aircraft between such points as he may designate * * * at fixed rates per pound, including equipment, under such rates, rules, and regulations as he may prescribe, not exceeding $3 per pound for air mail for the first one thousand miles and not to exceed 30 cents per pound additional for each additional one hundred miles or fractional part thereof for routes in excess of one thousand miles in length, * * * (Act approved June 3, 1926)

Bids will be received at the Department in Washington until noon of July 26, 1926.

The schedule to be adopted will require an average flying speed of approximately 90 miles an hour. The Department realizes that in some instances, due to weather conditions, etc., it may be impracticable to maintain such an average, but under favorable conditions even better time may be possible. Proper allowance will be made in all such cases.

The postage rate over contract air mail routes is 10 cents an ounce or fraction thereof where the length of the route is not over 1,000 miles, 15 cents up to and including 1,500 miles, 20 cents where the length is over 1,500 miles, with 5 cents additional for each zone traveled over the transcontinental government operated route.

Vought Planes to be Manufactured Abroad

George W Vought, president of the Chance Vought Corporation, one of the large producers of aircraft in this country, sailed on the U S S Leviathan on May 22, to close negotiations with one of the large producers of aircraft in Europe for the production of a series of commercial multi-engine airplanes to new designs of Chance Vought.

When arrangements have been completed, Mr Vought will make an aerial tour of Europe over the principal airlines now operating. The aerial tour is being arranged by Imperial Airways, Ltd, the principal English commercial air carrier, and will include visits to a number of continental aircraft factories.

The Gordon Bennett Cup Race

Seven nations were represented in the international balloon race for the Gordon Bennett cup and despite the heavy weather which prevailed on May 30, fourteen balloons left Antwerp, in the race. One Spanish entrant and two French entrants failed to get away owing to accidents of a minor nature and these were therefore, eliminated automatically from the contest

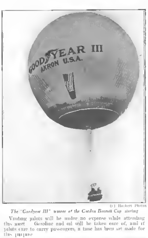
The balloons scattered over Holland, Denmark, and Scandinavia and Sweden in the south-western wind which was blowing and the race was won by Wade T Van Orman, the American balloonist flying the entrant of the Goodyear Tire and Rubber Co, "Goodyear III" Van Orman flew a distance of 850 kms and landed at Solveberg, Sweden Second in the race was the U S Army balloon, "S 16", piloted by Capt Hawthorne C Gray. The "S 16" covered a distance of 800 kms and landed at Kracow, Mecklenburg.

Thus the Gordon Bennett Cup comes to America for 1926-1927 It will be recalled that the original Gordon Bennett Cup was won outright by Belgium three years ago and as a consequence, the King of the Belgiums replaced the trophy with a new cup which is the present Gordon Bennett Cup for which the race has just been held

Camden Air Meet

On July 5, at the Moro-Phillips tract, Camden, N J, the Courier-Post Air Meet will take place. A part of the meet will include the celebration centering around the dedication of the Delaware River Bridge and the opening of the South Jersey Exposition, at which President Coolidge will be present, and the meet will probably prove the largest aviation event ever held in that section. The program includes the Courier Post Air Transport Race, the winner of which will receive the trophy and a prize of $500, the pilot making second place to receive a prize of $150 The race will be for 100 miles, over a 10 mile course

Other events will be a race for National Guard planes, a demonstration of aerial combat by U S Army pursuit planes, stunt flying by Army fliers, exhibition of cotton dusting planes, parachute jumps and various novelty races



(c) Herbert Photos

The "Goodyear III" winner of the Gordon Bennett Cup starting

Visiting pilots will be under no expense while attending this meet Gasoline and oil will be taken care of, and if pilots care to carry passengers, a time has been set aside for this purpose

The American participants in the Gordon Bennett Balloon Race Left to right, J. A Boettner, H W. Maxon, Lieut J F Early, Capt H. C Gray, W W Morton and W T Van Orman

New Air Mail Headquarters

The headquarters of the Air Mail Service which, since Oct 1, 1924, have been maintained at Omaha, Neb, will be removed to Washington, D. C on July 1, 1926. Announcement to this effect was made on June 15 by Acting Postmaster General Bartlett

It has been found that the continuance of the headquarters of the Air Mail Service at Omaha is no longer necessary and that this branch of the Post Office Department can better be administered from this city

The Omaha headquarters are at present in charge of Stephen A. Cisler, Superintendent of the Air Mail Service, with D B Colyer, Assistant Superintendent There are about 15 clerks at the Omaha office who will be brought back to Washington when the transfer is completed

A Handbook for the Model Enthusiast

MINIATURE AIRCRAFT FLIERS, by Terence Vincent. M.A.F. Director Little Loose-Leaf Library, No 12, published by F H. Cheley, 601 Steele Street, Denver Colo.

It would seem almost natural in the development of a new and highly complex art that man should first attempt the solution of the many problems upon such a scale that, in linear dimensions, at least, he may from the outset consider himself the master. Later, as the intricate problems of the actual development are overcome, he will venture forth into larger spheres in which linear dimensions take on major proportions, but man, having overcome the basic problems, is still master of the situation Such a procedure has characterized many early developments, none the least significant of which has been Aviation Many were the early pioneers who ushered in their final mastery of the problems of flying with the aid of miniature models Perhaps they were laughed at in times gone by, and the writer speaks from experience, but the fact remains that many even of our greatest aeronautical engineers at this time were, in their younger days, model flying enthusiasts

Yet, still there is sometimes a tendency to look upon model flying as a purely unnecessary and childish pastime, of no real consequence Why this should be so has always been a puzzle, for we have model yacht enthusiasts, numbering among them many who are far from being mere youngsters playing with toys, and even model locomotive engineers attract many of mature age to their ranks

However, that the status of the model airplane flier is now being firmly established is a fact for which much credit is due Terence Vincent of Chicago, the author of this pocket handbook, "Miniature Aircraft Fliers" The book opens with a very complete and highly enlightening outline of the numerous competitions, which are standardized and held regularly, for model airplanes in all and every class. The competitions are held under the auspices of the Miniature Aircraft Fliers, an association of youthful airplane designers who bend their energies into producing model airplanes of all and every description with a view to securing a class championship, a tournament prize, or, at best, a world record Speed contests, climbing contests, load carrying contests, etc, etc number among the activities of the Miniature Aircraft Fliers Information on all these contests is fully available in Mr Vincent's book It will be news and a marked surprise to many to know that the speed record for a model plane is actually 57 3 m p h, this speed being attained over a measured course by the model constructed by John Rappold, Chicago, who thereby won the Central Lions Club Trophy

Following on to a discussion of the models themselves, Mr. Vincent gives valuable constructional details on the various parts of a model plane These details extend into the very minute questions of—a rubber band here, a pin there, or a spot of glue—and must undoubtedly prove of considerable value to the model airplane maker Propeller making is discussed at some length and the whole work is fully illustrated with diagrams with dimensions marked in a clear manner. The booklet closes with detailed descriptions of some of the most successful model airplanes

It would seem that this is a publication which might well find its way into the hands of every model airplane enthusiast, whether young or old Not the least important in its character is the fact that it is printed in the standard loose-leaf size, with the necessary punch holes provided for the placing of the booklet into its owner's pocket notebook cover for immediate reference —W L.LeP

Walter Hinton,—well known as the commander of the NC 4 which flew the Atlantic Ocean—who has recently opened the Aviators Preparatory Institute in New York providing a very complete aeronautical correspondence course

Navy Airplane Bids

Bids were opened at the Navy Department on June 7 for three-purpose (Bombing, Scouting and Torpedo) planes for the new airplane carriers, Lexington and Saratoga.

Five companies submitted bids which were for planes, singly and in groups of two, seven, ten and twenty planes and equipment The number of planes to be purchased will be determined by the total purchase price, but will approximate 100

The following companies submitted bids

Boeing Airplane Co Seattle Wash Curtiss Airplane and Motor Co of Garden City N Y Douglas Company of Santa Monica Calif Huff Daland Airplane, Inc., Bristol Pa Glenn Martin Company Cleveland Ohio

Gloster Gamecocks (Jupiter engines) of the British Royal Air Force participating in the recent elimination trials for the Low Bombing Competition, the winners of which will perform in the R.A.F Display on July 3 It is reported that during the trials, a smoke bomb fell through the roof of a local baker's shop and the question, 'Who bombed the Baker' immediately became a rife one.

On Control of Airplanes at Low Speeds

Few subjects in the sphere of airplane design from the purely aerodynamic standpoint are of such importance as is the question of the control of airplanes at speeds corresponding with the stalled attitude of airfoils More thought and experimental investigation has been and is still being given to this subject than to almost any other aerodynamic problem. Furthermore, there is by no means a standard of agreement on this subject and, therefore, it would appear that the more opportunity there is for discussion, the better

B. V. Korvin Kroukovsky, taking an opposite stand to that of the writer in an article on this subject in the May 31 issue of AVIATION, puts up a strong argument in defense of the present system of airplane control, in the issue of June 21 He holds that the present form of stabilizer is perfectly adequate in providing the pilot of an airplane with the necessary control when stalled, stating that, as the wing of the plane stalls, the downwash angle increases and, in a modern design with a symmetrical stabilizer, this will automatically introduce a restoring couple which will tend to dive the machine Mr Korvin-Kroukovsky accepts the fact that the pilot loses control but only insofar as he is unable to prevent the ensuing nose dive started by the restoring couple

What actually happens at the stall is this the center of pressure of the wing travels back rapidly as the stall is approached, while beyond the stall its position becomes almost stationary, although it still moves back slowly Thus, the stability of the plane is actually increased at the stall and the machine tends to put itself into one of two stable motions, namely, a spin, due to the autorotative tendency of the wing, or a nose dive, due to the restoring couple of the stabilizer The angle of downwash follows the lift curve of the wing, becoming more or less constant above the stall but, while the stabilizing power of the fixed tailplane is increased, the power of the elevators is not affected and, furthermore, the entire system of longitudinal control is sloppy owing to the poor conditions in which the stabilizer is situated

It would seem that the real trouble with the present system of longitudinal control is not that a modern airplane cannot be stalled without an inevitable crash but that the conditions following immediately upon a stall are such as to increase the probability of a crash when the plane is flying near the ground, as just before a landing, when a stall is most likely to occur accidently There is little hope for a pilot, if his plane is stalled close to the ground, even though the plane may be capable of inherently regaining flying speed, if this operation is accompanied by a nose dive,—no matter how small Considerable trouble, therefore, lies in the fact that the pilot's actions in unstalled flight are, to a certain extent, especially in landing, hampered unconsciously by a fear of the stall

With regard to lateral control, while it is perfectly sound to state that roll due to yaw, or L_r, is increased above the stall, for the simple reason that, owing to the autorotative element, the tendency to resist rolling is less, and the rudder, if of large enough size can, therefore, be employed to control the roll, it must be remembered that this alone cannot produce satisfactory control because independent control of over banking and of direction is necessary

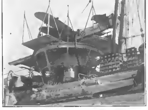
The advantages of an airplane employing the principles of control demonstrated in the Hill Pterodactyl are that not only is the lateral control entirely independent of the attitude of the machine, but the longitudinal control is as perfect after the stall as before. Assuming constant thrust, the Pterodactyl merely alters its rate of ascent or descent with changes in the elevator setting of the plane Thus, if the machine is gliding with the engine throttled, and the stick is pulled back, the forward speed is checked, while the angle of descent increases And this holds true even at high angles above the stall, the attitude of the machine to the ground remaining approximately horizontal So that, while it would not be reasonable to land the Pterodactyl at an attitude above the stall, for the simple reason that the rate of descent would be too much for the undercarriage, the machine can, nevertheless, be brought into the landing field at a very steep angle of descent, at an attitude far above the stall and the rate of descent controlled merely by adjusting the elevators, with the engine throttled

It is true that there is a certain aerodynamic loss in the lateral control systems of the Pterodactyl due to the reflexing of the "controller" type but this loss also occurs in the washed out and set up ailerons advocated by Mr Korvin-Kroukovsky and the loss is to a certain extent inevitable —W. L. LeP

British and American Airplane Catapults

The British cruiser Vindictive has recently gone out to the China station fitted with an improved device for launching an airplane, with its pilot, from the forepart of the ship She is said to be the first British cruiser so equipped.

In some of the latest of these catapults, as developed, for example, in the United States, compressed air is replaced by an explosive method which shoots the airplane into the air just as if it were being discharged from a gun A charge of powder is placed in a chamber just beneath the trolley upon which the airplane is fixed The trolley runs along a track some 50 ft in length When the gunpowder charge is fired, the force generated, acting through the pulleys and cables, shoots the trolley forward along its track The engine of the airplane has already been started, and by the time the machine reaches the end of its track the acceleration is so great that it is moving through the air at 35 or 40 m.p.h. At this pace its wings are able to exercise a certain amount of lift and it glides off the trolley and starts normal flight



The special flying off turntable which is undergoing trials in the British Navy on board H.M.S. Enterprise

With early types of catapult, it was found difficult to launch the planes at exactly their proper flying speed, and they had to dip down a little after leaving the track before they were moving through the air fast enough for horizontal flight. But in the latest gun-fired type of catapult the process has become so improved that the plane can be shot into the air in such a fashion that the machine glides straight away without any appreciable loss of altitude after leaving the catapult

The evolution of a successful catapult means that warships can carry and launch their own airplanes without having to depend upon an aircraft carrier accompanying the fleet

When it has completed its flight the catapult-launched plane alights on the water close beside the ship and is hoisted aboard

D'Oisy Reaches Chita, Siberia

Capt Pelletier d'Oisy, the French aviator, who is flying from Paris to Tokio, reached Chita, Siberia, June 16 from Irkutsk, which he left the previous afternoon

Helpless Hints to Dizzy Aviators

By Their Newest and Dizziest Member—WILFORD GERBRACHT

To those who are not familiar with Aviation I dedicate this great manuscript, and for their benefit I will start with the mistake that is most often made:

1. Never attempt to fly a ship with the motor missing. It is always better in the long run to delay the flight until the motor can be found and replaced in the ship. This is not necessary in ships of the Cyflbban class.

2. All J.N.4D's should be equipped with booster magnetos as the plane can often be boosted over low lying fences, stray dogs, etc., with this equipment.

3. The quickest and safest way to take an old "Jenny" out of a small field is to get a stone boat and a span of mules.

4. Another excellent way is to elevate the ship several hundred feet by means of the elevator. When the elevator stops the machine should be held in this position by means of the prop. The motor should now be warmed up, which is best done by placing canned heat in the crank case and lighting it by means of a fuse which is placed thru the breather pipe. As soon as the engine is warmed up the prop can be knocked out from under the ship and the resulting dive will put sufficient way on the machine to enable it to clear any normal fence by three or four inches, barring adverse winds.

5. If dirt collects between spokes of wheels an easy way to remove same is to land the ship cross wind in a heavy gale. This should wipe the wheels clean. In fact, it is most successful in wiping out the entire landing gear.

6. In using the above method one must be careful not to strip the teeth or cogs from the main landing gear. In case this should happen they can be stuck back in place with any good grade of chewing gum after it has been well chewed by the teeth of the wind.

Regarding Pancake Landings

7. If you are forced to land in a dense forest always make a pancake landing, picking out a dense clump of trees for this purpose. Some may think the extra weight resulting from carrying sufficient pancakes for landings of this type would decrease the performance to a prohibitive degree, however, I have found from experience during the entire fourteen minutes I have been in the air, that the extra feeling of safety in knowing that you are prepared for emergencies of this sort, more often offsets the slight loss of performance. Besides, if you are in a wild country and far from houses and restaurants, the pancakes can be used for food.

8. In flying a Waco or other ships with oleo type of shock absorbers, I would suggest the use of real creamery butter in place of the oleo. The shocks are reduced to such an extent that the extra cost of butter over the oleo is more than offset by the preventing of undue stress on the landing gear in making a poor landing, besides the better lubrication qualities of the butter make landing gears last much longer before the cogs wear out. I would also suggest that you use well salted butter as this would prevent slipping.

9. It might be well to mention here that when flying during the harvest season in Iowa I have found it advisable to double the shock absorbers as, in landing in an oat field, where the shocks were very thick, I found the single shock absorbers were unable to absorb the oat shock as I ran into them with the final results that when I hit the thirteenth shock the propeller caught a quantity of oats and blew them into the radiator where the heat and moisture caused them to grow profusely, thus completely filling the air passages and making it necessary for me to discard the engine and install an air-cooled one.

10. A good reliable compass should be carried in every ship, in which one is to do any cross country flying as, in passing through clouds or fog, it is very easy to loose one's bearings. This was brought forcibly to my notice during my recent flight to China, which I foolishly attempted without a compass. When I was well out over the Pacific Ocean I encountered fog and in the space of a few minutes had completely lost my bearings, not only the main bearings, but the crank shaft as well. I did not notice it at the time but kept on until I arrived in China the next day. When I stopped the motor to take on gas you can imagine my dismay when I took up the crank to crank the engine and found the crank shaft gone. Well, of course, the crank was no good without the crank shaft and in order to start the engine I was forced to have the machine towed to the top of a large hill and as she gained speed in the descent I gradually engaged the landing gear with the timing gear and we took off beautifully. In fact, I took off two chimneys and a chinaman's cue, which I could not dodge as it was standing straight up, no doubt caused by fright at the noise the old tub was making as she broadcasted the chimney bricks over the landscape. Well, ever since then I have used a compass.

11. Speaking of China, it would be well to warn American aviators that the old adage of "When in Rome do as the Romans do" does not apply to flying in China. At least, do not attempt a Chinese landing, for as you know the Chinese read backwards, and, in fact, do most things just the reverse of the way we do in America, so, instead of making a three-point landing, as we do, consisting of two wheels and a tail skid, their perfect three-point landing would consist of two wing tips and a propeller. This should not be attempted on American ships.

As space will not permit me to offer more helpless hints, I will close this manuscript, hoping that it will make the way brighter for other dizzy aviators and help them along their airingways.

European Commercial Aviation

International problems in commercial aviation in Europe have, at last, been overcome. The terms of the Allied air agreement with Germany, which was recently sent for signature to the Quay d'Orsay, permits of the rapid expansion of commercial aviation in Europe. For several months Allied and German experts, under the auspices of the Conference of Ambassadors, have prepared this accord relative to German aviation. Berlin held that the nine rules, established in 1921 by the Conference of Ambassadors, which limited military aviation, effectively prevented the development of commercial flying.

Now the assurances voluntarily given by the Reich are replacing the imposed conditions of the Versailles Treaty and its subsequent interpretations. The committee of guarantee will be suppressed, but if there is any doubt about Germany's legitimate use of aviation, the League of Nations can intervene. Military planes will still be subjected to severe restrictions. Aviators who may be trained militarily are extremely limited in number. Subsidies are to be given by the Reich only for passenger and commercial flying. In return, Germany is allowed to construct freely.

This releases French commercial flying, too, because when certain clauses of the Versailles Treaty expired in 1925, Germany was able to refuse passage over its territory to foreign machines not corresponding to the rules. In practice, this meant that French machines were barred altogether. It was difficult to keep the air routes open, for most European lines naturally cross Germany. From the Baltic Sea to the Alps lies Germany and also between the Netherlands and Denmark on the North Sea. Thus, Germany holds the key to the position, and until an understanding was reached and the restrictions removed, progress in international flying in Europe was badly handicapped.

No European country can make commercial flying worth while, unless its airplanes may cross its borders. European commercial flying must either be on an international scale or must languish. Some of the regulations dictated by fear were, from every viewpoint foolish. The result was the formation of two groups of countries for the purpose of commercial aviation, but neither could properly operate. This division of Europe, with France and England on one side, and the Scandinavian, Baltic Central European countries and Germany on the other, made for friction, of which, Germany, owing to her size, actually got the better. It is important from the viewpoint of flying, but it is more important from the viewpoint of good relations, that the barriers in the air are demolished.

AIRPORTS AND AIRWAYS

New Indianapolis Field

Indianapolis will dedicate its new airport at the famed Indianapolis Motor Speedway Monday July 17. Under the leadership of the Chamber of Commerce of Indianapolis, and with the whole-hearted cooperation of the Indianapolis Motor Speedway Company and the Indiana National Guard, the field has just been established.

The Speedway Company has provided the free use of its large inner field, enclosed by its 2½ mile racing track, the only proviso being that on the day of the Speedway race each year, May 30, the airport not be used. Each of the other 364 days of the year it will be available for airplanes. Adjutant General William H. Kershner, of the Indiana National Guard, has obtained permission for the removal of the 113th aero squadron, the air unit of the Indiana Guard, from Kokomo, Indiana, to the new airport. The unit's two steel hangars will soon be moved to the new field. The Indianapolis Airport Corporation, formed by the interested citizens for the operation of the field, has provided sufficient money for the removal and the erection of an additional hangar for commercial planes using the field.

A comprehensive program has been planned for the dedication. Airplane manufacturers and makers of airplane equipment will have displays on the field during the day. At night, a program in the air will be given with guest aviators from surrounding fields participating. It is expected that the very latest in plane building and plane devices will be on display, and the event will be attractive not only to the general public, but to the aviators of the central west as well. Distinguished persons, including President Coolidge, Edsel Ford, Anthony Fokker and others, have been invited to attend.

The Speedway field is already established in the minds of aviators. It was used during the World War by the Government, and since then also has had some use, although the Army's landing field has been at Ft. Benjamin Harrison near Indianapolis.

The dedication ceremonies will begin late in the afternoon. First on the program will be the firing of a salute to the governor by the 113th aero squadron. A plane flying low will drop the corner stone of the field. Then will follow an aerial review, a sham battle and the usual night air stunts. Landing flares, huge electric search lights used on landing fields, and various pyrotechnic displays will be used to illuminate the field. Capt. W. F. Donnelly, army instructor assigned to the 113th squadron, plans to fly to all surrounding fields, announcing the plans for the dedication and inviting fliers to participate in the ceremonies.

The airport committee of the Chamber of Commerce is preparing to handle a crowd of from 50,000 to 75,000. All the money received from the event will be used to equip the field. Use of the Speedway grounds was donated by James A. Allison, Carl G. Fischer and Arthur C. Newby, owners. The members of the 113th aero squadron will maintain the field.

Denver, Colo.

Students of the Polytechnic High School and the University of California, Los Angeles, have within the past year formed clubs to arouse interest in aviation. Activities of the High School club have consisted of social events and occasional trips from local airports. The Prop and Aileron Club, at the University, was formed to study aeronautical design and experiments have been conducted with gliders and a biplane, which has been undergoing tests at Clover Field. The student body of the University numbers about 6,000 members and besides running articles in its daily paper on aeronautics has shown much interest in the lectures delivered by men active in aviation. The University will move next year to its new Westwood site, which is nearer Clover Field and the Douglas factory. When this is done, it is planned to establish an air unit in the R. O. T. C., and carry on ground instruction at the Douglas plant and flying instruction at the field.

Stockton, Cal., to Promote Aviation

Indications are that Stockton, Cal., is about to become the center of strong aviation activity within a short time. J. C. Riley, head of the Fisk Plane Manufacturing Company, of Los Angeles, investigating the feasibility of establishing a plant in that city, has been favorably impressed with its possibilities as a point for the growth of an aircraft industry and believes that Stockton has the opportunity of becoming the industrial center for aviation on the Pacific Coast.

The Stockton Chamber of Commerce have formed plans, which will become the basis upon which an airport will be established and the aircraft industry encouraged in that city. If the aircraft industry of California makes Stockton its headquarters, outside capital will be brought in and hundreds of citizens familiar with and interested in aircraft manufacture will be added to the population.

Mr. Riley addressed the Stockton Chamber of Commerce and the Stockton Realtors' Association on the possibilities of the city and stirred considerable enthusiasm among his hearers through his tributes and estimates of Stockton's importance industrially, particularly from the standpoint of an expanding aviation industry.

Standard Oil Co. Ground Markers

The Standard Oil Company of California has recently completed the marking of the roofs of its bulk-oil storage stations between San Diego and Seattle for the benefit of fliers on cross-country flights. These block letters are a minimum of twelve feet in height and in many cases much larger. In good weather the signs are all readable from 3000 ft. up.

Another thing the company is doing as an aid to aerial navigation—a development of the original plan—is to place at each station a white arrow indicating true North. As compasses are sometimes unreliable, this indication of direction will be of much benefit under certain circumstances. So far, about 100 stations have been marked and shortly the marking of airways eastward from Seattle, Portland, San Francisco, Los Angeles and San Diego will be begun.

A typical marker at Hollywood, Calif.

First Plane Built in Greece Successfully Flown

In the presence of General Pangalos, President of Greece, Mme. Pangalos, who christened the machine, the President of the Committee of Aerial Defense and most of the foreign Ministers, the first airplane to be built in Greece accomplished its trials successfully, making an altitude of 7,000 ft., with full military load. The plane is a Blackburn two-seater Torpedo Carrier, and, with the exception of the engine, a Napier Lion, 450 hp., every part was constructed at the new factory near Athens. It is expected that four or five planes per week will shortly be built.


First plane built in Greece. The Blackburn torpedo carrier (Napier Lion)

Canadian Air Harbors

Information has been received in the Office of the Chief of Air Service that the air stations mentioned below have been designated by the Canadian Government as places which are licensed air harbors: Lynbrook near Moose Jaw, Sask., Virden, Manitoba, Leaside Aerodrome, Toronto. The above are for airplanes only. Public customs seaplane stations are established at the Canadian Vickers, Limited, Montreal, and the City of Fredericton, N. B. Air Harbor licenses are granted for all the chief operating bases of the commercial companies engaged in aviation in Canada.

Pine Valley Flying Field

Pine Valley Flying Field, operated by the Ludington Exhibition Company, Inc., at Clementon, N. J., is 13 miles south-east of that town, 1 mile south of the White Horse Pike, and 1½ miles west of the town of Berlin. It contains 96 acres and is equipped with hangers, floodlights, and a B B T beacon.


Pine Valley Flying Field (field marked with dots)

Delivering Air Mail During Australian Wet Season

Pilots of the Western Australian Airways encounter the additional duty during the rainy season of delivering mail from the air. With landing grounds usually flooded at this time, the pilot has to fly low and estimate his distance so that the mail bag can be dropped as near the post office as possible.

Edgewood Arsenal Aviation Facilities

At the present time there is a cut being made of the North and South run of the flying field at Edgewood Arsenal, Md. Although landings can be made inside of this cut, pilots who are not familiar with the field should land at Aberdeen (Phillips Field) and get first-hand information on the status of the field. The East and West run is in good condition. The power-house and dock are good landmarks for seaplane navigation. The beach North of the dock has a general slope to a depth of about 4 ft., approximately 75 ft. from the water's edge. There is a telephone on the dock, and there is usually someone there from 9 00 a.m. to 4:30 p m.

Peru May Use Airplanes For Cotton Spraying

If the recommendation of an American entomologist is followed, the Government of Peru will contract for airplanes to combat parasites which have been destroying the cotton crops. Peru would be the first South American country to adopt this method of spraying. Planters in the Canete Valley recently engaged an entomologist to study their problem and this recommendation is the result of his observations.

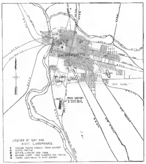
Airplane to Spray Alfalfa

The Army will furnish an airplane for a test to be made by the Department of Agriculture of the effectiveness of spraying from the air in the eradication of the alfalfa weevil in the Salt Lake City basin, Utah, according to an announcement from the War Department, May 20.

The experiment will be carried on for six weeks, the Department of Agriculture furnishing the pilot and paying the expenses of the work.

Irwin Airport

Irwin Airport, situated 4 miles south of the business section of Sacramento, Cal., is open to commercial operators and also private owners of planes. Hangars at the field are for rent by the day or month and the equipment of the airport includes rest rooms, telephone service, a lunch counter and attendants. The lighthouse is illuminated day and night and a filling station and repair shops form part of the modern equipment. A school is operated in connection with the field.



Map of the district surrounding the Irwin Airport

Planes Will Carry Food to Mountain Climbers

Feeding mountain climbers and holding planes in readiness to meet emergencies among the participants in Alpine sport is another activity into which aeronautics has branched. The Austrian and German Alpine Clubs, numbering more than a million members, have just closed a contract with the German Aero Lloyd Company for revictualling the Alpine huts in the Tyrolese and Bavarian Mountains and also to hold planes in readiness at specified places for help in case of accident. Some of these huts are so situated that small parachutes will be used to drop food. The price of food so transported will be ten per cent more than usual price.

Chicks Hatch in Airplane

A noise, so foreign to the usual aeronautical sounds that it attracted the attention of a passenger in a plane en route from London to Paris, recently, was the prelude to a discovery which it is believed was the first of its kind in aeronautical history Capt W G R Hinchliffe, pilot for the Imperial Airways, thought the passenger's alarm sufficient to warrant a landing Examination of the engine showed that part of the mechanism in good order, but an inspection of the cabin revealed a box of day-old chicks, chirping as merrily as though nesting in a barnyard

A Schoolboys' Aero Club

The boys of the Roger Ascham School of White Plains, N Y, have organized a club called the "Zenith Aero Club"

The objects of the club are

"To foster, encourage and advance the knowledge of aeronautics among its members To take, own and use money for the uses of the club"

All the boys between the ages of twelve and fifteen years, who are interested in aeronautics are members of the club The club has purchased several books on aeronautics

S Jackson of White Plains, N Y, is president and John Buttolph of Hartsdale N Y, is secretary-treasurer

The club would be glad to hear from similar bodies throughout the country

View of new Pitcairn Flying Field on Doylestown Pike 3 miles north of Willow Grove Pleasure Park and about 19 miles north of Philadelphia City Hall. The runways, measuring 4200 and 3600 feet, are believed to be the longest of any commercial flying field in America. The field is located on Lockerman Trail Route No. 2, and is in the midst of flat country. Two commodious hangars have been completed each with two entrances

Belgian Fliers Back From Congo

The Belgian airmen, Verhaegen, Coppens and Medaets, have arrived in Brussels completing their round trip flight to the Congo They were welcomed by King Albert and the members of the royal family and foreign diplomats including the attachés of the American embassy

U. S. Air Forces

Resignation of Major Raycroft Walsh

Maj Raycroft Walsh of the Army Air Service resigned his commission on June 1, 1926 The separation of Major Walsh from the Air Service is a distinct loss to this Branch. He was perhaps far better qualified as an expert on Latin American aviation conditions than any other American A few years ago Major Walsh led a flight through the various Central American countries and established contacts that were valuable In addition to his knowledge of Latin America Major Walsh was also a financial expert. He was the Finance Officer in the Office of the Chief of Air Service for the past few years, and has been considered a financial expert in Government work

Major Walsh entered the military service from Massachusetts in September, 1910, when he was commissioned as a Second Lieutenant in the Coast Artillery He was transferred to the Air Service near the beginning of the World War with a rank of Major He remained in the Air Service until his resignation.

Airship Flies Through Electrical Storm

On the return trip of the Airship TC-5 from Bolling Field to Langley Field on May 10, last, a severe electrical storm was encountered After a three hours' flight in the storm, during which the personnel on board the ship were continuously blinded by lightning, the big silvered ship finally arrived over Langley Field and came slowly and gracefully down into the hands of the landing party at 8 30 p m. Here Capt. C P Clark, Commanding Officer of lighter-than-air activities at Langley Field, took charge of the ship and walked it into the hangar under a cross hangar wind and with the light of the electric storm

The TC-5 was received May 8 from Aberdeen, Md, by the 19th Airship Company at Langley Field The ship was flown to Langley by Lieut J F Powell, Commanding Officer of the 18th Airship Company On May 10, the airship was given a test flight by Capt W E Kepner from Scott Field, who was on temporary duty at Langley Field in connection with the Bombing Contests. Lieuts R Kieburtz, 19th Airship Co, and J. F Early, 18th Airship Company, were on this flight as pilots The performance of the ship was satisfactory in every manner After the test flight, the TC-5 started on its flight to Washington at 2 20 p m., the crew consisting of Capt W E Kepner and 1st Lieut W A. Gray, pilots; Tech Sgt C Johnson, engineer, Pvt 1st Cl. J Winters, rigger, and Master Sgt Cade, passenger The trip was successfully completed at 5 30 p m, but just as the ship landed at Bolling Field a terrific rain and electrical storm sprang up There being no accommodations at the field for an airship, a chance had to be taken either way and it was decided to return to Langley Field that night After staying on the ground for ten minutes, and exchanging passengers, Master Sgt Cade for Lieutenant Montgomery, the TC-5 took off for the return trip Captain Kepner and Lieutenant Gray, being old and experienced airship pilots, knew that it would be much safer to fly during an electric storm over water than over mountains in Maryland and Virginia, where lightning was especially hard, so instead of following a direct course to Langley Field they shaped their course over the Potomac River and then the coast of Chesapeake Bay

Army and Navy in Joint Maneuvers in 1927

It has been announced by the Navy Department that during May, 1927, the Army and Navy will join in maneuvers in the Narragansett Bay area, giving the most extensive demonstration of aviation from the defensive standpoint ever attempted The entire fleet will sail from Guantanamo Bay, Cuba, for New York April 23 and the full strength of the aircraft squadrons will be employed Ashore the Army Air Service will use all available planes

Progress at the Advanced Flying School

The present class at the Air Service Advanced Flying School, Kelly Field, Texas, now consists of 62 men flying. Ten have graduated from the single seaters and 4 are still on this type of ship, 28 are on the 180 and 300 deg turns, 9 on hurdles, 2 under special instruction and 2 are under the care of the Flight Surgeon. The class reached the maximum flying time the second week in May, securing a total of 522 hours and 10 minutes, an average of 7 hours and 55 minutes for each student flying. Night flying is now in progress and some of the students have started flying the Martin Bombers.

Army Forest Patrol

The Secretary of War has notified the Secretary of Agriculture that the activities of the Army Air Service in aiding the Dept. of Agriculture in carrying on the airplane forest fire patrol will be discontinued after the Summer of 1926. Secretary Davis points out that this action is necessary since the stock of war time planes has been diminishing and as they are not being replaced, it was at some sacrifice that the War Department placed at the disposal of the Dept of Agriculture ten planes during the summer of 1925. In doing the same for the summer of 1926 it will be necessary for the War Dept to slightly reduce some of its own Air Service operations. It happens that the time when the forest fire hazard is greatest the War Dept. training camps are in progress, when all available equipment is needed. As a solution to the problem, Secretary Davis suggests that very possibly by the beginning of the Fiscal Year 1928, there will be commercial aircraft which could be secured by hire for the forest fire patrol, and that the War Dept is willing to make available the services of a competent officer to assist in carrying on the patrol work and the rendering of such assistance in the selections of pilots and hire of planes as may be necessary.

Activities of San Antonio Air Depot

During the month of April the Engineering Department of the San Antonio Air Intermediate Depot, Duncan Field, Texas, overhauled and repaired 36 airplanes and 82 engines, viz: Airplanes—12 PT-1, 8 DH-4M, 3 Douglas 02, 1 Douglas C-1, 1 VE-9, 1 NBS-1, 1 DH-4B-1, 1 DH-4BP-1. Engines—41 Liberty, 40 Wright-E, 1 Lawrance L-4.

During this month this Depot shipped 200 Wright-A engines to the Naval Air Station at Pensacola, Fla, also a total of 32 airplanes were flight-tested and ferried from the Operations Office of this Depot. These planes included Martin Bombers, DH's, Douglas Transports and O-2's, MB3A's, PT-1's, and JN6H's. Each of these planes received not less than two hours of flying time, in consequence of which all pilots of the post were given plenty of time in the air.

The Depot received instructions to turn out by June 1st 32 JN planes for the Summer Reserve Training Camps at Kelly Field, Biggs Field, Post Field and Fort Sam Houston, Texas.

Army to Aid Weevil Fight

The Secretary of War has authorized the Army Air Service to lend the Dept. of Agriculture in a campaign against the alfalfa weevil which the Dept of Agriculture will make this year. The Air Service will turn over to the Dept. of Agriculture a suitable plane now housed at Woodward Field, Salt Lake City, Utah, which will be used in a dusting experiment for the control of the alfalfa weevil to be carried on for a period of six weeks. The Dept. of Agriculture fears a heavy infestation of alfalfa weevil this year, and it is thought that the alfalfa grown on the plane of this basin can be successfully and economically dusted by airplane. The Dept. of Agriculture will furnish the pilot and pay all expenses incurred in flying the plane.

Schedule for Air Squadron of Asiatic Fleet

The Air Squadron of the Asiatic fleet, which will have bases from July to October at Tsingtao and Chefoo, during that quarter will make flights to Balabac, Jolo, Tawi Tawi, Malalag Bay and Davao for reconnaissance and training and the tender Jason will base at Zamboango.

Testing Army Air Parachute

The Parachute and Armament Departments of the Air Service Technical School at Chanute Field, Rantoul, Ill., have been experimenting with a new system for testing service type parachutes. The results to date have been successful and proves to be an improvement over the methods used before. The work in testing is greatly facilitated, much time is saved, and the parachute is required to meet actual conditions and strains that would be encountered in an emergency jump by an aviator. The new method employed consists of dropping two dummies (or four could be used if desired) from the bomb racks located on each wing of the Douglas O-2. Two dummies were especially constructed under the direction of Tech. Sgt Wilson for this purpose. The dummies with parachutes attached are fastened to the bomb rack under each wing, in the same manner that a bomb would be carried. The rip-cord of the parachute is tied to the wing with a cord seven feet long. In the actual test, the pilot obtains the desired speed of the airplane for testing the parachute, then releases the dummies from the bomb racks simultaneously (or alternately, if desired) with the aid of the bomb release handle in the cock pit. After the dummies have fallen from the plane the length of the cord tied to the wing, the rip-cord, if pulled, releases the parachute from the pack. The pilot can observe the action of one parachute and the observer the other. By both parachutes being released at the same time a close comparison can be made in the action of the two parachutes, checking the opening speed and the rate of descent with one to the other. The rate of opening has not varied one-fifth of one second in any parachute tested to date. These parachutes have been tested at an altitude of one hundred feet and found to open and land very successfully which proves the speed and reliability of the Army parachute. Most of the tests were made at an altitude of four hundred feet. By this new system a dual test is made in that the bomb racks are tested along with the parachutes. Twelve tests were made last week by Captain Broberg as pilot and Tech Sgt Wilson as observer.

Army Air Orders

First Lieut Frederick M Hopkins, jr., A.S., Kelly Field, to Mitchel Field.

First Lieut. John Y. York, jr., A.S., Scott Field, to Washington.

Sec Lieut Benjamin T Starkey, A.S., Phillips Field, to Langley Field.

Maj. Frank M Kennedy, A.S., relieved from assignment and duty at McCook Field, and will report to commandant A.S. Eng. Sch., that station, for duty.

Sec Lieut Henry August Frese, A.S. Res., San Antonio, to active duty Kelly Field, reverting to inactive status June 28.

First Lieut George H Bare, A.S. (Inf.), Brooks Field, to Fort Sam Houston.

First Lieut. Donald D. Fitzgerald, A.S., Kelly Field, to McCook Field.

Capt Edgar P Sorensen, A.S., Kelly Field, to McCook Field.

Navy Air Orders

Ens Howell C Fish det. Nav. A. Sta., Pensacola, to temp. duty U.S.S. Chewink.

Lieut Robert W. Thomas det. Nav. A. Sta., San Diego, to U.S.S. Kanawha.

Ens Wilfred E. Lankenau det. Nav. A. Sta., Pensacola, to U.S.S. Converse.

Ch. Mach. Walter F. Marriner det. Aircf. Sqdns., Sctg Flt., to Nav. A. Sta., Ammun. Dep., Mare Island.

Lieut. Charles A. Kirtley det. 15th Nav. Dist., Balboa, C. Z., to Nav. A. Sta., N.O.B., Hampton Roads.

Lieut. Comdr. William H. Whitmore det. Nav. A. St., Pensacola, to Nav. Hosp., Norfolk.

Lieut. Henry R. Oster det. Nav. A. Sta., Pensacola, to Navy Yard, Philadelphia.

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FOR SALE Two used OX5 motors, complete with hubs, $275.00, both ready to be put in ships. Would trade for Hisso Dale A Seitz, 209 No 18th St, Kansas City, Kansas

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FOR SALE A Jenny, first class condition, $750.00, or will trade for equal price Standard Frank J. Pappas, 941 Market St, Meadville, Pa

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